

***Vanderhorstia bella*, a New Goby from Fiji  
(Teleostei: Gobiidae)**

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A single individual of a new goby species in the genus *Vanderhorstia* was collected from a fine sand bottom at Vanua Balavu Island, Bay of Islands, in the Northern Lau Group of Fiji. The species differs from all other described species in the genus except *V. mertensi* by having 17 dorsal and 18 anal-fin rays. It differs from *V. mertensi* by having about 77 versus 52–62 longitudinal scales and lacking a row of black spots the length of its midside. *Vanderhorstia bella* has much lavender coloration on the head and body and many bright yellow spots.

While conducting a survey of the fishes of Fiji, we collected a single individual of a spectacularly colored new goby in the genus *Vanderhorstia*. The specimen was collected using rotenone from a fine, silty, sand bottom at a depth of 8.3 m at Vanua Balavu Island, Bay of Islands, in the Northern Lau Group of Fiji.

The genus *Vanderhorstia* is represented by 12 described species, which are considered to be valid (Winterbottom et al. 2005).

MATERIALS AND METHODS

All counts and measurements follow Winterbottom et al. (2005). Measurements were made to the nearest 0.1 mm using dial calipers and are expressed as percentage of standard length (SL). Dorsal pterygiophore formula and some other counts were taken from a radiograph. Format generally follows Winterbottom et al. (2005) for ease of comparison, and when characters are the same, their description is used. The holotype is deposited at the California Academy of Sciences (CAS).

SPECIES DESCRIPTION

***Vanderhorstia bella* Greenfield and Longenecker, sp. nov.**

Figs. 1–4.

**MATERIAL EXAMINED.**— Holotype: CAS 222208, 70.9 mm SL, Fiji, Northern Lau Group, Vanua Balavu Island, Bay of Islands, 17°10.692'S, 179°00.887'W, fine, silty, sand with small coral patch, 8.3 m, 7 January 2003, field number G03-22, collected by D.W. Greenfield, K.R. Longenecker, and R.C. Langston.

**DIAGNOSIS.**— A species in the genus *Vanderhorstia* with 17 segmented dorsal-fin rays, 18 segmented anal-fin rays, about 77 longitudinal scales, and a pointed caudal fin, lacking a row of black spots on its side, and having yellow spots on a lavender background on its head and anterior part of its body.

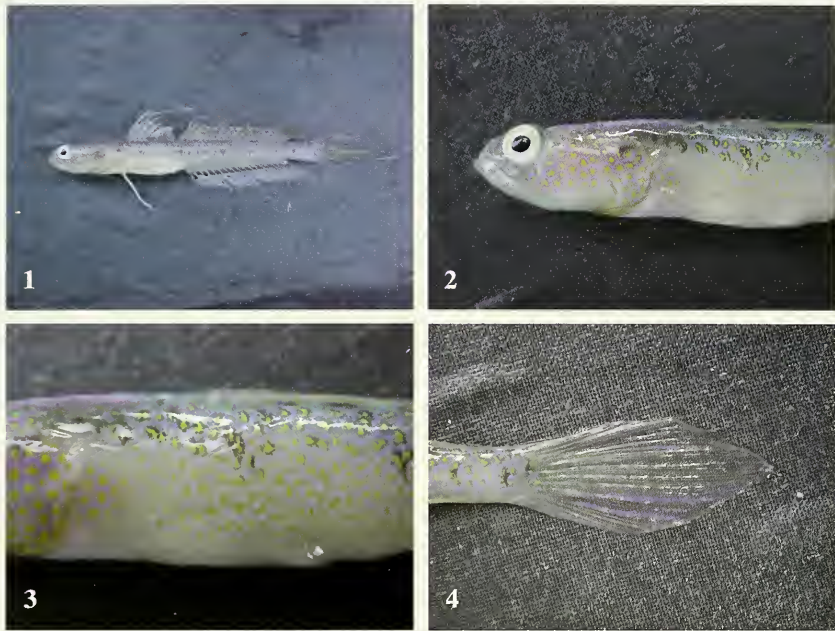
**DESCRIPTION.**— Dorsal-fin elements VI-I,17, all rays branched; anal-fin elements I,18, all rays branched; pectoral-fin rays 18, upper and lowermost rays unbranched; pelvic-fin elements I,5; segmented caudal-fin rays 17, 9 dorsal + 8 ventral branched rays; dorsal unsegmented (procurrent) caudal-fin rays 7; ventral unsegmented (procurrent) caudal-fin rays 7; longitudinal scales about 77; transverse scale rows from anal-fin origin anterodorsally to first dorsal-fin base 20; transverse scales from anal-fin origin posterodorsally to second dorsal-fin base 17; predorsal scales absent in midline; scales beginning above pectoral-fin base extend posteriorly to insertion of first dorsal fin; circumpeduncular scales 12; no scales on pectoral-fin base; scales on prepelvic region embedded and difficult to count; gill rakers 4 + 16 on outer surface of first arch; vertebrae 10 + 16; dorsal pterygiophore formula 3 (2,2,1,1); epural 1; anal-fin pterygiophores anterior to first haemal spine 2; pleural ribs on third to tenth precaudal vertebrae.

The following measurements are expressed as % SL: head length 25.2; head width 9.4; head depth 13.1; snout length 3.7; eye diameter 5.5; interorbital width 2.0; nape width 7.4; jaw length 11.1; body depth at origin of first dorsal fin 13.1; body depth at origin of anal fin 11.2; body width 7.3; predorsal length 29.1; prepelvic length 27.5; preanal length 51.7; caudal-peduncle length 11.9; caudal-peduncle depth 7.3; length of first dorsal-fin base 19.5; length of second dorsal-fin base 41.8; pectoral-fin length 28.2; pelvic-fin length 24.0; length of first dorsal-fin spine 18.3; length of second dorsal-fin spine 17.5; length of third dorsal-fin spine 16.7; length of fourth dorsal-fin spine 27.1; length of fifth dorsal-fin spine 22.4; length of sixth dorsal-fin spine 16.4; length of spine of second dorsal fin 8.9; length of first segmented ray of second dorsal fin 12.4; length of longest segmented ray of second dorsal fin (= 4<sup>th</sup>) 13.7; length of anal-fin spine 7.9; length of first segmented ray of anal fin 10.2; length of longest segmented ray of anal fin (= 5<sup>th</sup>) 15.1; length of pelvic-fin spine 7.1; length of first segmented ray of pelvic fin 11.5; length of fifth segmented ray of pelvic fin 21.6; caudal-fin length 37.1.

Body elongate and compressed. Head slightly compressed, its width 71.7% of depth. Snout very short, its length 67% of eye diameter; snout does not protrude beyond upper lip. Eye dorso-lateral, moderately large, its diameter 22.0% of head length; interorbital space narrow its width narrower than pupil diameter and 8.1% of head length. No distinct, deep trough around eyes from interorbital to postorbital regions. No cutaneous ridge along dorsal midline of nape. Gape moderately oblique, forming an angle of about 28° with body axis. Lower jaw projecting anteriorly beyond upper jaw; posterior end of jaws reach to slightly behind posterior eye margin; jaw length 43.9% of head length.

Anterior nasal opening a short tube, with the posterior edge slightly longer than the anterior edge; posterior nasal opening a large pore, located adjacent to eye. Tip of tongue rounded, anterior portion free from floor of mouth. Posteroventral margin of lower lip entire, no mental flap on chin. Gill opening wide, extending anteriorly to vertical line through posterior margin of pupil of eye; gill membranes attach to very narrow isthmus; no distinct free rear margin. No fleshy projections on lateral wing of shoulder girdle. No bony projections along posterior margin of preopercle.

Caudal peduncle moderately slender, its depth 61.3% of caudal-peduncle length. First dorsal fin higher than second dorsal fin; first dorsal fin close to, but not connected to second dorsal fin by membrane; fourth spine of first dorsal fin longest, 155.4% of second spine length, not filamentous; all dorsal spines slender and flexible; fourth segmented ray of second dorsal fin longest. Origin of anal fin on vertical base with first segmented ray of second dorsal fin; height of anal fin slightly higher than second dorsal fin; anal-fin spine slender and flexible; fifth anal-fin ray longest. Pectoral fin nearly lanceolate, reaching posteriorly to vertical line through base of second dorsal fin between spine and first segmented ray; upper and lowermost pectoral-fin rays unbranched, the remainder branched. Origin of pelvic fin about midway between posterior edge of opercular membrane and



FIGURES 1–4 (CAS 222208); Holotype of *Vanderhorstia bella*. (1) Full lateral view; (2) Closeup of head and anterior portion of body; (3) Closeup of anterior body showing distinctive color markings; (4) Closeup of caudal fin.

dorsal-fin origin; pelvic fins joined medially by well-developed frenum (between spines) and inter-radial membrane (between innermost segmented rays); pelvic frenum moderately thin, with smooth posterior margin; all segmented pelvic-fin rays branched.

Head scaleless, including predorsal; scales cycloid on anterior part of body back to about tips of pectoral fins, becoming larger and ctenoid with peripheral cteni posteriorly; no scales on pectoral-fin base; scales overlying basal region of caudal fin all ctenoid.

Teeth in both jaws unicuspid; upper jaw with outer row of spaced, enlarged, curved caniniform teeth and an inner row of small similar teeth, teeth near symphysis enlarged and point posteriorly; lower jaw with 1–3 enlarged, curved, spaced, caniniform teeth, two irregular rows of smaller teeth medially grading into a single row posteriorly, an innermost row of 2–3 much enlarged curved, spaced canines at bend of dentary; no teeth on vomer or palatine.

Cephalic sensory systems: pore pattern as in *Vanderhorstia nannai* (Winterbottom 2005, Fig. 3). All cephalic sensory-papillae rows uniserial, not forming multiple rows; relatively reduced longitudinal pattern of sensory papillae rows on cheek; row *a* short and reduced, with about four sensory papillae; row *b* very short, extending back from row *a* to about one-third distance to preopercle; row *d* extending back just past end of maxilla.

Color of fresh specimen: Background color white, overlaid by lavender in many areas. Side of head bright, iridescent lavender covered with many small (about one-third pupil diameter) round, bright yellow spots extending from eye back onto pectoral-fin base. Snout and jaws white with a slight lavender tinge. A black line in fold between premaxilla and maxilla anterior to eye. Pupil black, iris silver with tinges of yellow. Lower side of head white, top of head and nape lavender. Sides of body with lavender tinge on upper half (less intense than on head), white on lower half; upper half covered with irregularly-shaped yellow spots edged in black; lower half with smaller yellow spots without black edges; a series of 13 irregular black vertical lines on midside below sec-



ond dorsal fin; a series of 10 dark blotches running from middle of first dorsal-fin base to caudal peduncle. Pectoral and pelvic fins clear. First dorsal fin light yellow. Second dorsal and anal fins light yellow with distal lavender margins. Caudal fin with light yellow rays and lavender membranes in between.

Color in alcohol: Background color cream. Top of snout and anterior portion of premaxilla and maxilla dusky, posterior part of jaws cream, a distinct black line between premaxilla and maxilla, antero-ventral to eye. Side of head and pectoral-fin base with numerous round light spots; pupil of eye black, iris silver with black dorsal margin. Top of head and nape with scattered small brown spots, upper half of body with irregular small light spots surrounded with dark pigment; lower half of body and breast cream. Caudal, anal and pelvic fins peppered with small dark pigment spots; pectoral fins immaculate; first and second dorsal fins peppered with small dark spots and with small round light spots.

**ETYMOLOGY.**— From the Latin *bellus*, an adjective meaning beautiful, referring to the striking coloration of the species.

**COMPARISONS.**— *Vanderhorstia bella* is in the subfamily Gobiinae because it has a single anterior pore in the interorbital area, the lower jaw has more than one row of teeth, both the dorsal and anal fins are separate from the caudal fin, and the two dorsal fins are separate. The fish keys to the genus *Vanderhorstia* in Larson and Murdy (2001) because of the following features: 1a. First gill slit open; 2b. Body scaled; 8b. No dermal crest anterior to first dorsal fin; 11b. No barbels on underside of head; 16b. Dorsal-fin spines thin and flexible; 21b and 22b. Preopercle lacking spines; 23b. Dorsal-fin origin behind pectoral-fin base; 24b. Cheeks without prominent vertical fleshy flaps bearing papillae; 25b. Pelvic fins without fleshy frenum folded forward; 30b. Chin without mental frenum; 34b. Head without fine fleshy flaps and bumps; 35b. Head pores present; 39b. Pelvic fins completely connected by membrane; 43b. Mouth not small and vertical; 44b. Cheeks and operculum naked; 48a. Gill opening extending forward to rear margin of eye; 49b. Head papillae in a longitudinal pattern; 50a–50b. There is one more anal than dorsal-fin ray, which would key to *Silhouettea*, but because of its very short snout, pointed caudal fin, approximately 77 longitudinal scales, smooth-edged frenum, and rounded tongue it clearly does not fit the diagnosis of Larson and Miller (1986). Also, other *Vanderhorstia* species have more anal than dorsal-fin rays (e.g., *V. mertensi*), thus the key is in error and 50b. was chosen; 51b. No iris lappet and tongue not deeply bilobed; 52b. Second dorsal fin and anal fin with 1 spine and more than 10 soft rays; 53b. No distinct black ocellus in each dorsal fin; 54b. Caudal fin pointed, longer than head, body with spots, and no bright white spot on pectoral fins = *Vanderhorstia*. As pointed out by Shibukawa and Suzuki (2004), there are no derived characters supporting monophyly of *Vanderhorstia*, and it is separated from *Ctenogobiops* only by caudal-fin length and coloration.

The number of segmented dorsal and anal-fin rays of *V. bella* is high (D. 17, A. 18) compared to all other described species except *V. mertensi* Klausewitz which has 16 dorsal-fin rays and 17–18 anal-fin rays. All other described species have 10–14 dorsal-fin rays and 10–14 anal-fin rays. *Vanderhorstia bella* differs from *V. mertensi* by lacking its distinctive row of black spots that extend down the middle of its sides from the opercle to the caudal peduncle, and by having about 77 versus 52–62 longitudinal scales. Its high longitudinal scale count also separates it from all other species except *V. ambanoro* (Fourmanoir). It also differs in its distinctive coloration from all described and photographs of undescribed species in the literature.

Because the holotype was collected in a general rotenone station, we do not know if it associates with a shrimp or lives in a burrow; however, many other species in the genus *Vanderhorstia* do. The radiograph of the specimen showed that it had one clam and one snail in its stomach, suggesting that it may feed on items brought up by a shrimp.

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